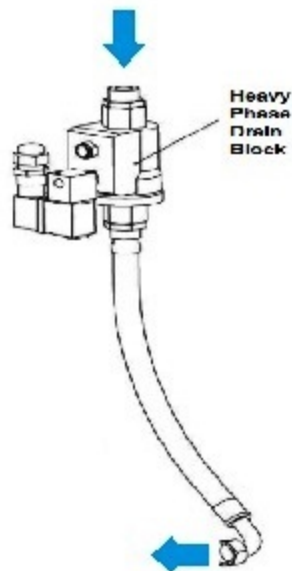
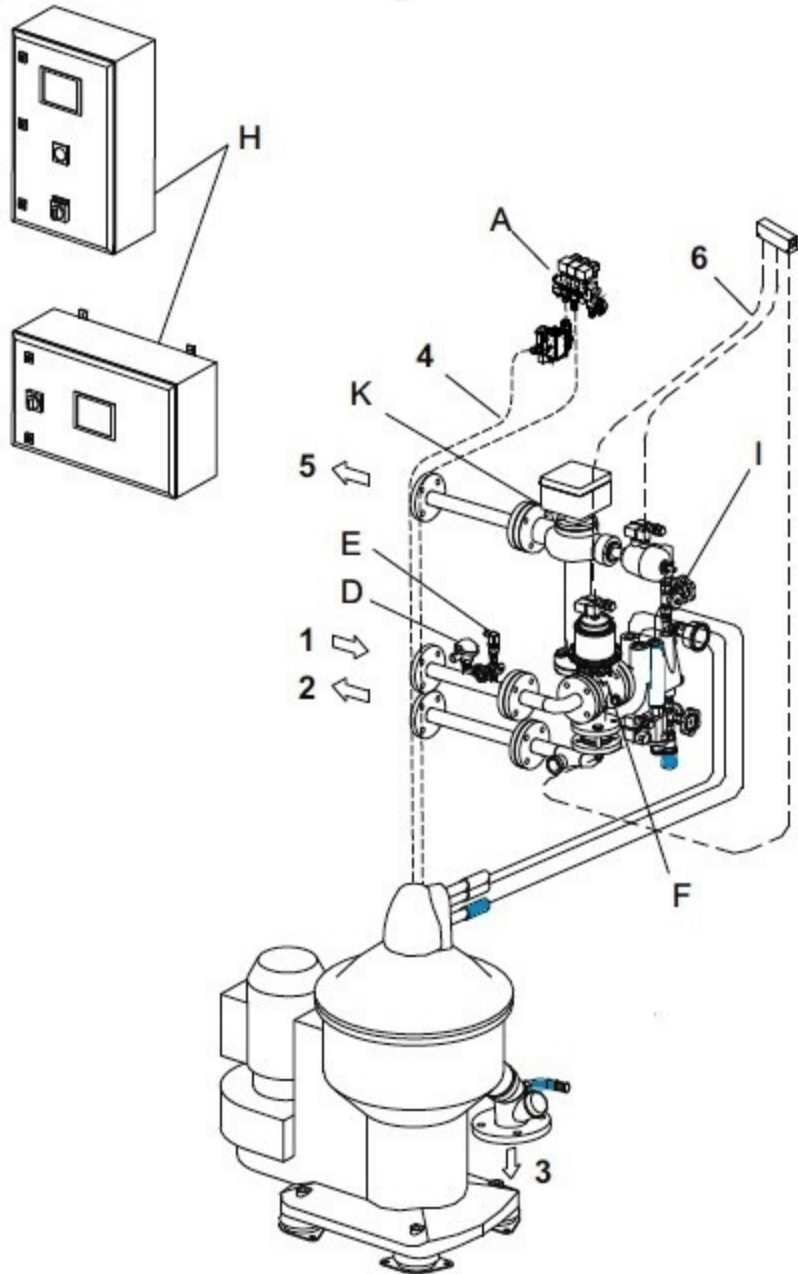


## ALCAP

1. Unprocessed oil inlet
2. Oil return
3. Sludge outlet
4. Water inlet
- A. Solenoid valve block, water : Distributes separator opening/closing water, and conditioning water, **displacement water**.
- B. Feed pump : Feeds unprocessed oil to the separator.
- C. Heater : Heats unprocessed oil to separation temperature.
- D. Temperature transmitter (TT1, TT2) : Measures the oil temperature and signals the control unit.
- E. Pressure transmitter, oil (PT1) : Measures the pressure in the oil inlet, and signals the control unit.
- F. Pneumatically controlled change-over valve (V1) : Directs the unprocessed oil to the separator, or back to the settling tank (recirculation – fuel oil only).
- G. Separator : Cleans the oil by removing water and solid particles.
- —. Optional equipment not part of the basic S Flex Separation System

5. Clean oil outlet to service tank
6. Water drain
- H. Control unit : Supervises the separation system.
- I. Pressure transmitter, oil (PT4) : Measures the pressure in the oil outlet, and signals the control unit.
- J. Regulating valve (RV4) : To manually regulate the back-pressure in the clean oil outlet
- K. Water transducer (MT60) : Measures change in water content in the cleaned oil, and signals the control unit.
- L. Pneumatically controlled shut-off valve (V4) : Closes the clean oil outlet.
- M. Pressure transmitter, water (PT5) : Measures the pressure in the water drain outlet, and signals the control unit.
- N. Drain valve (V5) : Opens to drain separated water from the separator.



- 1. Oil inlet
- 2. Oil recirculation
- 3. Sludge and water outlet
- 4. Operating water
- 5. Clean oil outlet
- A. Safety valve SV10A (lube oil only)
- D. Temp transmitter (TT1, TT2)

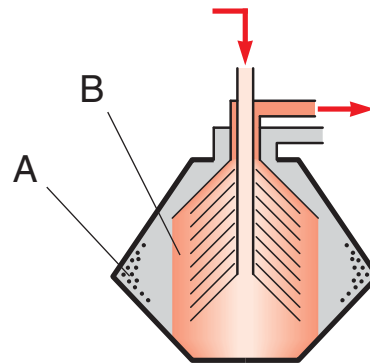
- E. Pressure transmitter (PT1)
- F. Change-over valve
- H. EPC 60 Control unit
- I. Pressure transmitter (PT4)
- J. Back pressure valve (RV4)
- K. Water transducer (MT60)

**ALCAP**

# 2 The Process

## 2.1 Principle

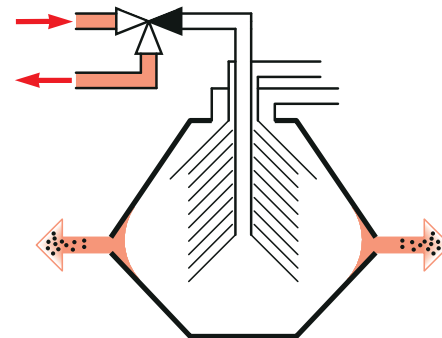
During the separation process, sludge and water accumulate at the periphery of the separator bowl.



P00356BC

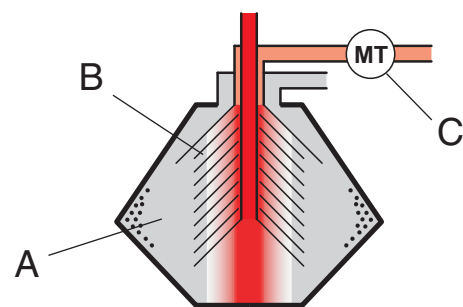
- A. Sludge and water
- B. Oil

Sludge and water are discharged at preset time intervals. During discharge, the oil inlet is closed.



P00356CA

Excessive water can also be drained from the separator bowl between discharges.

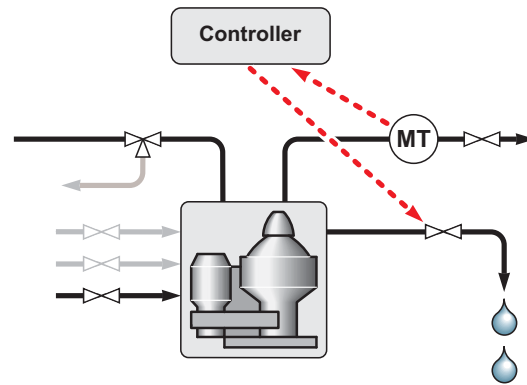


P00356DC

- A. Water
- B. Disc stack
- C. Water transducer

The cleaned oil leaving the separator is tested for traces of water. Any increase in water is detected by the water transducer.

The signal from the water transducer is continuously transmitted to the control unit, in which a reference value is stored. The control unit compares the transducer signal with the reference value. A significant deviation from the reference value will cause draining of water.

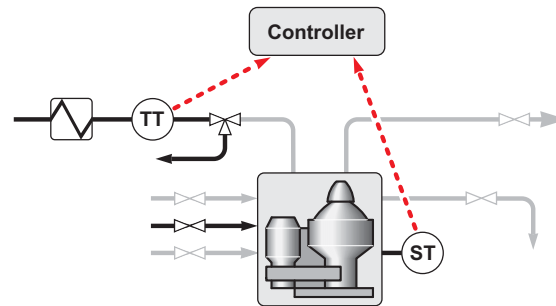


P00356EC

## 2.2 Process Cycle Start

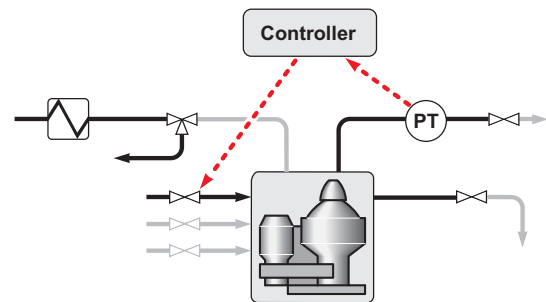
First the oil pump, separator, and heater are started.

The temperature transmitter (TT) and the speed transmitter (ST) signal the EPC-60 control unit continuously. When the correct separator speed and the correct temperature are reached, a sludge discharge is carried out to ensure the bowl is empty. The control unit then starts the process cycle.



P00356FC

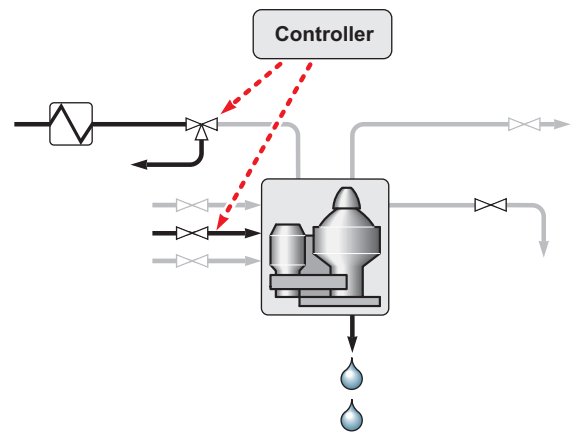
1. The change-over valve directs the oil to the recirculation line. Conditioning water is added to the separator bowl until the pressure sensor in the oil outlet senses pressure and signals the control unit.



P00356GC

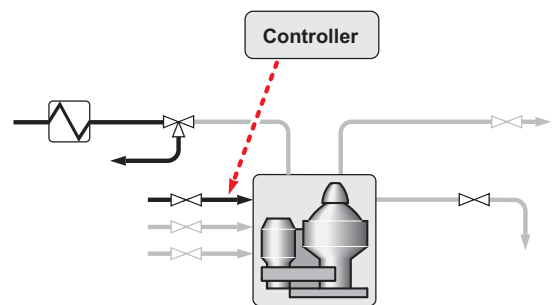
2. The control unit registers the time taken for water addition. This water flow reference value is later used to calculate the correct amount of conditioning water and displacement water to be added.

3. The separator discharges.



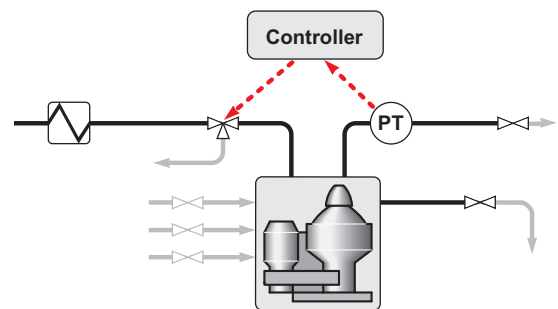
P003560C

4. Using the flow rate calculated in paragraph 2 above, the control unit signals the solenoid valve to open so that the correct amount of conditioning water is added to the separator bowl.



P00356NC

5. The change-over valve opens so that oil is directed to the separator bowl. When pressure in the oil outlet is sensed, the pressure sensor (PT) signals the control unit. The control unit calculates and stores the time taken to add oil to the bowl.



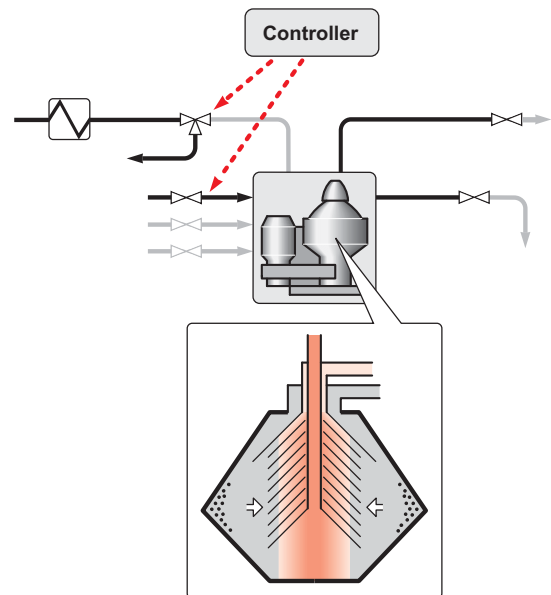
P00356MC

The cleaning process is now running. Unprocessed oil is fed to the separator, and clean oil is pumped from the separator.

## 2.3 Discharge

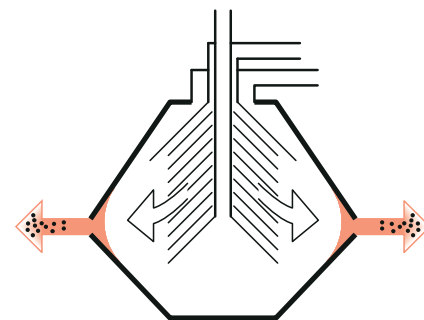
The separator discharges after a preset time has elapsed. The following sequence takes place:

1. The change-over valve changes to oil recirculation.
2. The control unit signals the solenoid valve to open so that displacement water is added to push the oil towards the disc stack.



P00356RC

3. After the time for displacement water addition has elapsed, the separator discharges.
4. Conditioning water is then added, and a new separation cycle begins.

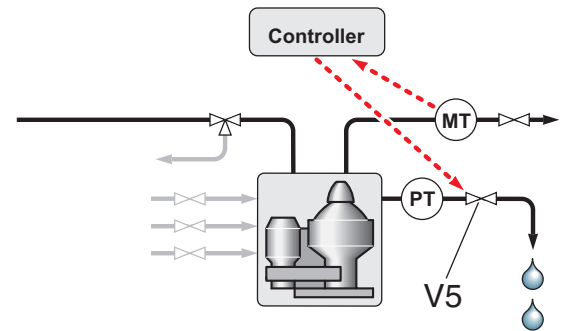


P00356JA

## 2.4 Increased Water Content

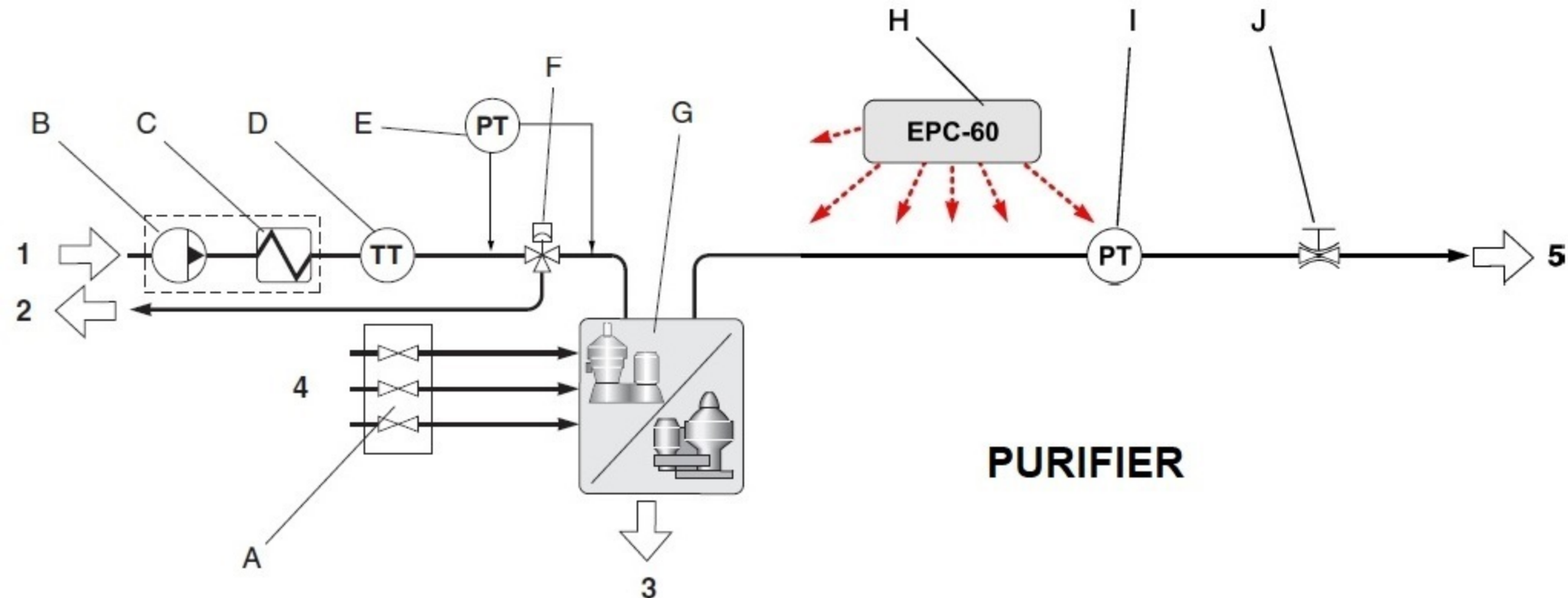
If the water transducer senses increased water content in the oil, the following takes place:

1. The water drain valve (V5) opens for a number of seconds.
2. The water drain valve closes again, and the transducer signal is evaluated.



P00356KE

3. If there is still an increase in water content, the drain valve opens again. If the water content is still high after the drain valve has opened five times, a discharge is initiated.
4. If the water content has decreased, the separation cycle returns to normal.

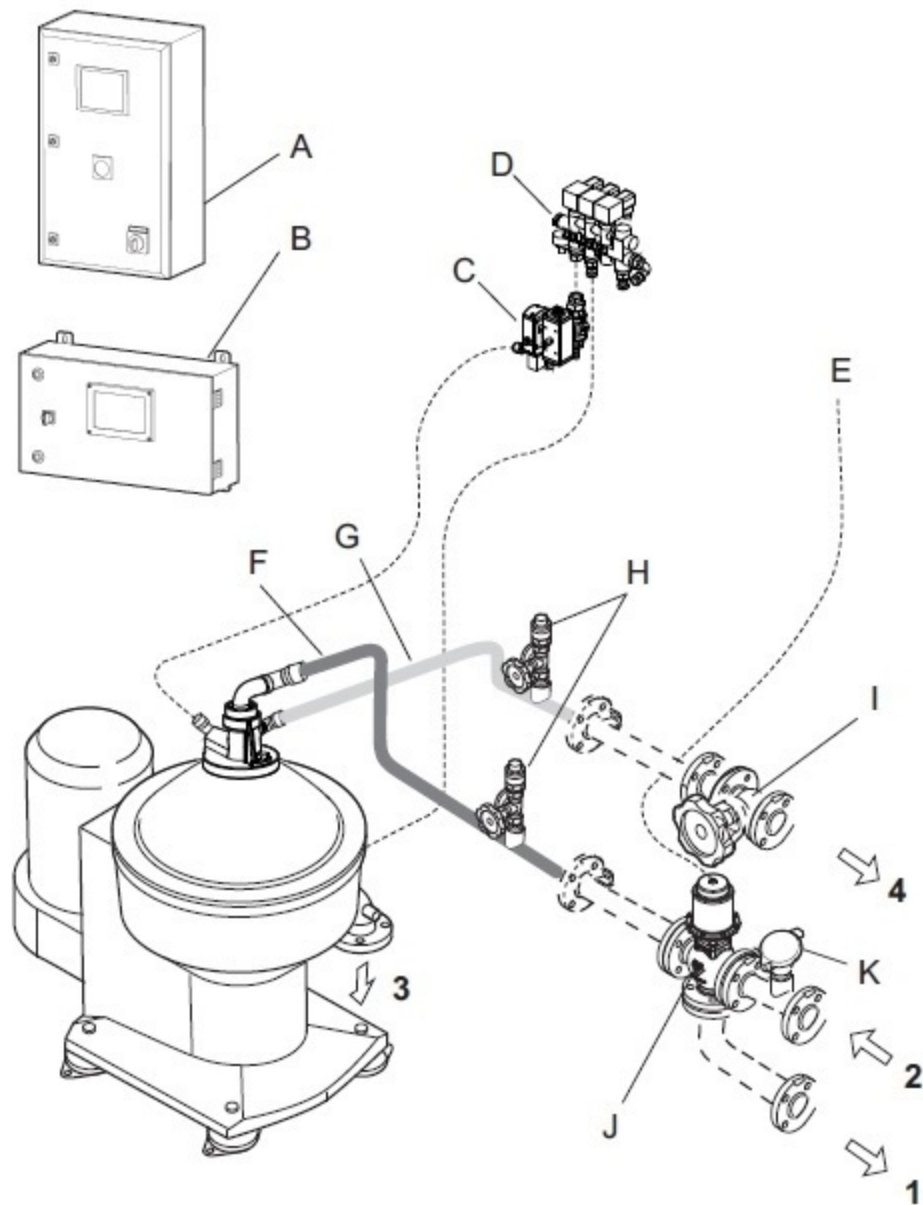


1. Unprocessed oil inlet
2. Oil return
3. Sludge and water outlet
4. Water inlet
- A. Solenoid valve block, water : Distributes separator opening/closing water, and conditioning water (sealing water).
- B. Feed pump : Feeds unprocessed oil to the separator.
- C. Heater : Heats unprocessed oil to separation temperature.
- D. Temperature transmitter (TT1, TT2) : Measures the oil temperature and signals the control unit.
- E. Pressure transmitter, oil (PT1) : Measures the pressure in the oil inlet, and signals the control unit.  
(The position of PT depends on separator size and design.)
- F. Pneumatically controlled change-over valve  
(V1) : Directs the unprocessed oil to the separator, or back to the settling tank (recirculation – fuel oil only).
- G. Separator : Cleans the oil by removing water and solid particles.
- —. Optional equipment not part of the P Flex Separation System

5. Clean oil outlet to service tank
- H. Control unit : Supervises the separation system.
- I. Pressure transmitter, oil (PT4) : Measures the pressure in the oil outlet, and signals the control unit.
- J. Regulating valve (RV4) : Regulates the back-pressure in the clean oil outlet.

## PURIFIER





## PURIFIER

1. Oil inlet
2. Oil recirculation
3. Sludge and water outlet
4. Clean oil outlet
- A. EPC 60 Control unit and starter
- B. EPC 60 Control unit
- C. (Lube oil only)
- D. Operating water

- E. Operating air
- F. Oil in
- G. Oil out
- H. Pressure transmitters
- I. Regulating valve
- J. Pneumatic 3-way valve
- K. Temperature sensor

---

# 2 The Process

---

The terms used in this process description are explained in section [Definition of Terms on page 17](#).

## 2.1 Purifying

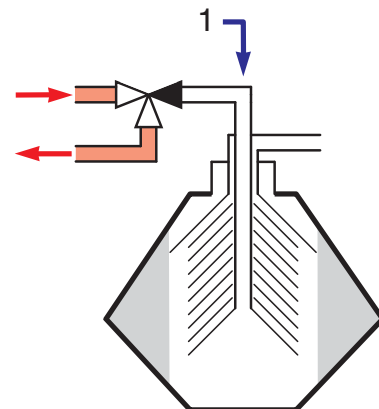
A water seal is added to the separator bowl through the water inlet.

The separator is equipped with a gravity disc, chosen according to factors such as oil temperature, density, and feed rate. This choice decides the position of the interface between oil and water seal.

The separator does not use a paring disc to pump out the separated water. Instead, the water leaves the bowl via the gravity disc, and leaves the separator through the water/sludge outlet.

### Process Cycle

1. A specific amount of water is added to the separator bowl to form a water seal.

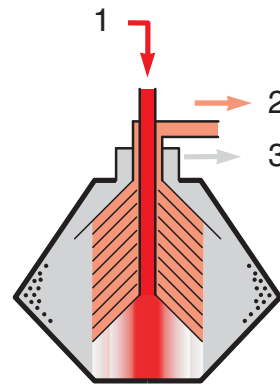


X025009B

1. *Sealing water*

2. The feeding of unprocessed oil to the centre of the separator bowl starts.

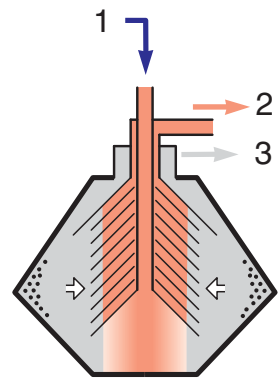
3. During the separation process sludge and water accumulate at the periphery of the separator bowl. Cleaned oil is fed from the separator by the integrated paring disc. Excessive water leaves the bowl through the water/sludge outlet to the sludge tank.



X025010B

1. Unprocessed oil
2. Processed oil
3. Water

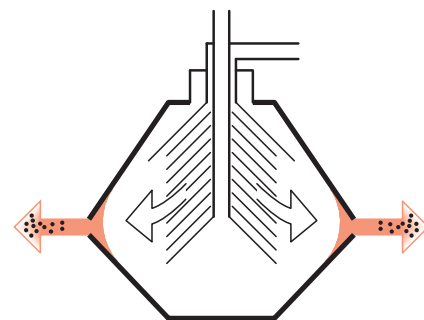
4. After the preset time between discharge sequences, the oil feeding stops.
5. Displacement water is added to the bowl. The displacement water reduces the oil loss at the following sludge discharge.



X025011B

1. Displacement water
2. Processed oil
3. Water

6. A sludge discharge is initiated

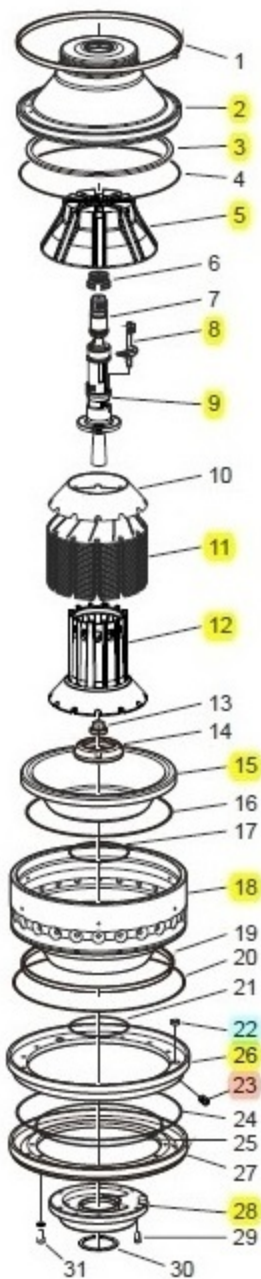


X025012A

The next process cycle starts with adding of water for a new water seal.

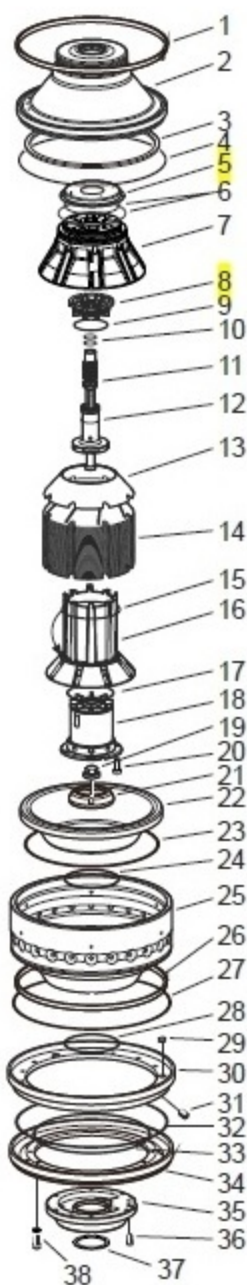
## 2.2 Definition of Terms

<b>Preset time between sludge discharge sequences (Parameter value)</b>	When this time has elapsed after a sludge discharge, the next discharge is initiated.
<b>Water seal (Parameter value)</b>	Water, added to the separator bowl to prevent oil from escaping at the water outlet.
<b>Displacement water</b>	Water, added to the separator bowl to displace the oil and ensure there is reduced loss of oil at sludge discharge.
<b>Purifier</b>	A separator that cleans the oil from water and sludge with continuous evacuating of separated water.



## ALCAP

1. Lock ring
2. Bowl hood
3. Seal ring
4. O-ring
5. Top disc
6. O-rings
7. Inlet and outlet pipe
8. Paring tube
9. Splash sealing
10. Bowl disc (without caulks)
11. Bowl discs
- 11a. Bowl discs (smaller diameter)
12. Distributor
13. Cap nut
14. Nut
15. Discharge slide
16. Rectangular ring
17. O-ring
18. Bowl body
19. Guide ring
20. Rectangular ring
21. O-ring
22. Valve plugs
23. Nozzle
24. Rectangular ring
25. O-ring
26. Operating slide
27. Holder
28. Operating water ring
29. Screws
30. Seal ring
31. Screws & washers



## PURIFIER

1. Lock ring
2. Bowl hood
3. Seal ring
4. O-ring
5. Gravity disc
6. O-rings
7. Top disc
8. Level ring
9. O-ring
10. O-rings
11. Inlet and outlet pipe
12. O-ring
13. Bowl disc (without caulks)
14. Bowl discs
15. O-ring
16. Distributor
17. O-ring
18. Distributor support
19. Cap nut
20. Screw
21. Nut
22. Discharge slide
23. Rectangular ring
24. O-ring
25. Bowl body
26. Guide ring
27. Rectangular ring
28. O-ring
29. Valve plugs
30. Operating slide
31. Nozzle
32. Rectangular ring
33. O-ring
34. Holder
35. Operating water ring
36. Screws
37. Seal ring
38. Screws & washers